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## Approaching Coal Mine Safety from a Comparative Law and Interdisciplinary Perspective

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# APPROACHING COAL MINE SAFETY FROM A COMPARATIVE LAW AND INTERDISCIPLINARY PERSPECTIVE

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*Anne Marie Lofaso\**

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## I. INTRODUCTION

Just fourteen months ago, the Sago Mine disaster<sup>1</sup> gripped the nation and the world. The fate of thirteen miners lost deep in a West Virginia coal mine hung in the balance as rescue efforts dragged on for two days and nights. The hopes and prayers of the miners' families and countless millions in a vast television audience seemed finally to be answered as the words "they're alive!" resounded through the mine site and around the world.<sup>2</sup> But the joy of a miracle

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\* Associate Professor, West Virginia University College of Law. Thanks to Pat McGinley, Ellen Dannin, Michael Goen, Jeff Hirsch, Brienne Greiner, Luke Boso, and Kate Hartung for their comments on these remarks, which were given on March 21, 2007, as part of the West Virginia Law Review's Symposium: *Thinking Outside of the Box: A Post-Sago Look at Coal Mine Safety*. Thanks also to Brienne Griener, Mary Claire Johnson, Latoya Porterfield, Thomas Matthew Lockhart, Gabriele Wohl and the editors of the *West Virginia Law Review*, volumes 109, 110, and 111, for their exceptional work on this symposium issue. Special thanks to John Fisher, Joyce McConnell, and Pat McGinley for their creative input on these remarks and the symposium.

<sup>1</sup> The Department of Labor's Mine Safety and Health Administration (MSHA) defines mining disasters as "mine accidents claiming five or more lives." MSHA, HISTORICAL DATA ON MINE DISASTERS IN THE UNITED STATES, <http://www.msha.gov/MSHAINFO/FactSheets/MSHAFCT8.HTM> (last visited June 4, 2007).

<sup>2</sup> Brian Todd, *Family Members Say 12 Miners Found Alive*, CNN, Jan. 4, 2006, <http://www.cnn.com/2006/US/01/03/mine.explosion/index.html>; Ann Scott Tyson, *Twelve Found Alive in W. Va. Coal Mine*, WASH POST, Jan. 4, 2006, <http://www.washingtonpost.com/wp-dyn/content/article/2006/01/03/AR2006010300304.html>.

was cruelly doused by the terrible news that, in fact, there was only one survivor clinging to life and that twelve miners had perished.<sup>3</sup>

The symposium of the *West Virginia Law Review* seeks to honor the Sago miners and all those who daily risk their lives. West Virginia coal miners and their peers throughout the American coalfields, as well as coal mines throughout the world, work in anonymity to provide the power that fuels the American and global economy and provides electricity that allows all of us to live in unparalleled comfort. The goal of this symposium is to explore and stimulate new ways of examining and solving a very old problem—the challenge of providing the safest possible workplace for America's coal miners.

It is in this vein that I talk to you today about the legal and policy issues arising from the Sago disaster. The Law Review editors have concluded that tackling the complex issues associated with coal mining safety requires the creative thinking involved in both comparative and interdisciplinary analysis. The value of this approach is apparent upon examination of the questions that have arisen in the wake of the Sago disaster. This approach appears all the more relevant today—just two days after another methane explosion claimed the lives of over 100 persons in a Russian coal mine thousands of miles from West Virginia.<sup>4</sup>

## II. COAL MINE SAFETY CONCERNS

### A. *Overview of U.S. Coal Mine Industry's Safety Issues*

It is axiomatic to observe that coal mining is a dangerous occupation. Putting aside the long-term health problems associated with mining, such as black lung disease,<sup>5</sup> coal operators, regulators, and miners face many potential hazards, most notably fires, floods, explosions, roof falls, and electrocution, as well as powered haulage and machinery accidents.<sup>6</sup>

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<sup>3</sup> Tamara Jones & Ann Scott Tyson, *After 44 Hours, Hope Showed its Cruel Side*, WASH. POST, Jan. 5, 2006, <http://www.washingtonpost.com/wp-dyn/content/article/2006/01/04/AR2006010400247.html>; Dennis B. Roddy & Steven Twedt, *Sago Mine Rescuers Sorry for Heartache*, POST-GAZETTE, May 4, 2006, <http://www.post-gazette.com/pg/06124/687382-85.stm>.

<sup>4</sup> *More Than 100 Dead in Siberian Mine Disaster*, RADIO FREE EUROPE, Mar. 20, 2007, <http://www.rferl.org/featuresarticle/2007/03/d23ddca0-e230-4974-8b85-3b6ff2054b4f.html>; *Siberian Mine Blast Kills Most in 10 Years*, USA TODAY, Mar. 19, 2007, [http://www.usatoday.com/news/world/2007-03-19-russia-mine\\_N.htm](http://www.usatoday.com/news/world/2007-03-19-russia-mine_N.htm).

<sup>5</sup> The United Mine Workers has estimated that 1500 former coal miners die of black lung disease each year. See *Democracy Now!*, *Whistleblower Warns the Bush Administration is Cutting Back Mining Safety Regulations*, [http://www.democracynow.org/2006/1/5/whistleblower\\_warns\\_the\\_bush\\_administration\\_is](http://www.democracynow.org/2006/1/5/whistleblower_warns_the_bush_administration_is) (last visited Sept. 19, 2008).

<sup>6</sup> In 2006, of the forty-seven coal-mining-related deaths, thirty-seven occurred underground. Of those underground fatalities, eighteen resulted from underground explosion, ten from falling debris inside the mine, five from accidents involving underground powered haulage, and two from

The coal mining industry's yearly fatality rate—at 2.3 per 10,000 workers—makes it five times more hazardous than the average private workplace.<sup>7</sup> Let me put that number in perspective. Twenty-six thousand students attend West Virginia University. That's as if six students were to die each year in some university-related accident, compared with a bit more than one death per year at other similarly sized universities.

Miners put themselves in harm's way every time they walk into a mine—and for what purpose? Mostly so that you and I can benefit from the comforts of modern society—about ninety-two percent of the coal produced in the United States is used to generate electricity.<sup>8</sup> And, fifty percent of the electricity generated in the United States is fueled by coal.<sup>9</sup> The rest of the coal not used for energy is used either for international export or for making other products such as synthetic materials, paper, steel, cement, and medicine.<sup>10</sup>

### B. Case Study: Sago

A brief synopsis of the Sago disaster drives home this point. At approximately 6:26 on the Monday morning of January 2, 2006, a methane explosion ripped through the Sago mine projecting outward from a sealed area into the active workings of the mine.<sup>11</sup> At the time of the explosion, twenty-nine miners were underground. Sixteen miners, who were located a fair distance from the ignition point and not seriously injured by the blast, escaped.<sup>12</sup> The other thirteen miners were near the blast and were not so fortunate. One miner

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underground fire. Twenty miners died in West Virginia coal mines and fifteen miners died in Kentucky coal mines. The remaining accidents generally involved surface mining accidents. See MSHA, 2006 FATALGRAMS AND FATAL INVESTIGATION REPORTS: COAL MINES, <http://www.msha.gov/FATALS/FABC2006.asp> (last visited June 4, 2007).

<sup>7</sup> Testimony of David G. Hawkins, Director, Climate Center, Natural Resources Defense Council: Full Committee Hearing on Coal Liquefaction and Gasification Before the Committee on Energy and Natural Resources, 109th Cong. at 6 nn. 6-7 (2006), available at [http://docs.nrdc.org/globalwarming/glo\\_06042401a.pdf](http://docs.nrdc.org/globalwarming/glo_06042401a.pdf) (citing Congressional Research Service, *U.S. Coal: A Primer on the Major Issues*, at 30 (March 25, 2003)).

<sup>8</sup> See statistics put out by the Energy Information Administration on the Energy Kid's Page, <http://www.eia.doe.gov/kids/energyfacts/sources/non-renewable/coal.html> (last visited June 4, 2007); see also *Coal's Past, Present, and Future*, <http://www.teachcoal.org/aboutcoal/articles/coalppf.html> (last visited June 4, 2007) (stating that nine out of ten tons of coal produced in the United States is used to generate electricity).

<sup>9</sup> See *The Future of Coal: Options for a Carbon-Constrained World (An Interdisciplinary MIT Study)*, (2007), [http://web.mit.edu/coal/The\\_Future\\_of\\_Coal.pdf](http://web.mit.edu/coal/The_Future_of_Coal.pdf) (last visited June 4, 2007). In West Virginia, "99% of the generated electricity comes from coal." WVOMHST, *West Virginia Coal Mining Facts*, <http://www.wvminesafety.org/wvcoalfacts.htm> (last visited June 4, 2007).

<sup>10</sup> See Energy Kid's Page, *supra* note 8.

<sup>11</sup> J. DAVITT MCATEER, THE SAGO MINE DISASTER: A PRELIMINARY REPORT TO GOVERNOR JOE MANCHIN 35-39 (July 2006), available at [http://www.wju.edu/sago/SagoMineDisasterReport\\_July2006.pdf](http://www.wju.edu/sago/SagoMineDisasterReport_July2006.pdf).

<sup>12</sup> *Id.* at 35.

was killed by the force of the explosion itself; the other twelve attempted to escape.<sup>13</sup> Consistent with their training, the twelve miners tried at first to activate their breathing apparatus, a self-contained self-rescuer, but four of those SCSRs reportedly failed or the miners otherwise were unable to operate them.<sup>14</sup> The miners “had to abort that escape attempt when they encountered thick dust and swirling smoke.”<sup>15</sup> So, still following approved safety training, the miners “turned back and retreated behind a curtain . . . at the working face of the section in an attempt to barricade themselves against the smoke and carbon monoxide created by the explosion.”<sup>16</sup> There those twelve miners waited, unaware that rescue efforts were moving much more slowly than they might have expected.

Lack of communication between the rescuers and the twelve survivors of the initial blast proved critical. For example, had technology been available that would have allowed communication between rescuers and miners, rescuers may have pinpointed the miners’ location allowing a borehole to be drilled near them which could have provided a fresh air source and/or an escape route. At a minimum, rescuers could have told the miners that there was breathable air in a nearby, still-accessible area.<sup>17</sup> Proper communication would have allowed rescuers to determine there was in fact no fire in the mine, which would have allowed rescue teams to enter the mine earlier. Instead, twelve miners surrounded by toxic methane laden air waited to be rescued; eleven of them eventually died of asphyxiation awaiting rescue.

The Sago disaster reminds us that the price we pay for our comfort can include serious injury and even death of those whose labors unlock the energy of coal.<sup>18</sup> As one newspaper report recently observed, “[m]ine disasters like Sago get headlines. But far more coal miners die . . . alone, crushed by heavy equipment, ground up by runaway machinery, buried beneath collapsed mine roofs.”<sup>19</sup>

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<sup>13</sup> *Id.*

<sup>14</sup> Each miner was equipped with the SR-100, an MSHA-approved SCSR, which contains a minimum of one hour of breathable air while breathing under exertion and closer to four hours of breathable air at rest. The SR-100 is the most widely used SCSR in U.S. mines. *Id.* at 50.

<sup>15</sup> *Id.* at 49.

<sup>16</sup> *Id.* at 35.

<sup>17</sup> *Id.* at 11-12.

<sup>18</sup> We need to be reminded of this in part because our legal actors have been complicit in blurring the connection between subjecting workers to dangerous working conditions and employer liability based on intentional rather than accidental conduct. *See, e.g., Millison v. E.I. Du Pont de Nemours & Co.*, 501 A.2d 505 (N.J. 1985) (using workers compensation exclusivity doctrine to bar workers from bringing lawsuit claiming harm caused by exposure to asbestos because employer had no intent to cause injury but allowing claim for harm caused by employer’s covering up workers’ illness because of exposure to asbestos because, in that case, employer intended to cause injury). I am grateful to Ellen Dannin for pointing this out to me.

<sup>19</sup> Ken Ward, Jr., *Disasters Get Headlines, but Miners Killed on the Job Die Alone*, CHARLESTON GAZETTE, Nov. 5, 2006, <http://wvgazette.com/News/Beyond+Sago/200611050006>.

### C. Questions Raised in Sago's Aftermath

In light of the Sago disaster, it seems relevant to ask: What, if any, obligations do we owe these workers who endanger themselves for our collective comfort? Members of the legal community may ask the question another way: What role, if any, should the law play to protect coal miner safety? These are fundamentally the types of questions that labor and employment lawyers and policy makers routinely ask.

It is natural to look to labor lawyers for answers to those questions. But in these ongoing symposium proceedings, the Law Review also seeks to examine the assumption of some that coal mining in the United States is as safe as it can be. Year 2006, with forty-seven coal miner deaths, was the deadliest year for American coal miners since 1995.<sup>20</sup> That's more than double the twenty-two coal miner deaths that occurred in 2005.<sup>21</sup> Twenty-four of those miners came from West Virginia—the most in any year for a quarter-century.<sup>22</sup>

Considering last year's spike in coal miner deaths, especially in West Virginia, it was natural to wonder whether other major coal-producing states, such as Kentucky<sup>23</sup> and Pennsylvania,<sup>24</sup> and other coal-producing countries,<sup>25</sup> such as China,<sup>26</sup> India,<sup>27</sup> Australia,<sup>28</sup> South Africa,<sup>29</sup> Russia<sup>30</sup> and Britain<sup>31</sup> were

<sup>20</sup> See MSHA, 2006 FATALGRAMS AND FATAL INVESTIGATION REPORTS: COAL MINES, *supra* note 6.

<sup>21</sup> Thomas Frank, *Coal Mine Deaths Spike Upward*, USA TODAY, Jan. 1, 2007, [http://www.usatoday.com/news/nation/2007-01-01-mine\\_x.htm?POE=click-refer](http://www.usatoday.com/news/nation/2007-01-01-mine_x.htm?POE=click-refer). See also MSHA, 2006 FATALGRAMS AND FATAL INVESTIGATION REPORTS: COAL MINES, *supra* note 6.

<sup>22</sup> Ken Ward, Jr., *Coal Industry Hopes To Avoid Deadly Repeat*, CHARLESTON GAZETTE, Feb. 20, 2007, [http://www.redorbit.com/news/entertainment/846924/coal\\_industry\\_hopes\\_to\\_avoid\\_deadly\\_repeat/index.html](http://www.redorbit.com/news/entertainment/846924/coal_industry_hopes_to_avoid_deadly_repeat/index.html).

<sup>23</sup> From 2005 to 2006, Kentucky's coal mining fatality rate doubled to sixteen deaths. See MSHA, COAL FATALITIES BY STATE, <http://www.msha.gov/stats/charts/coalbystate.asp> (last visited June 4, 2007).

<sup>24</sup> Pennsylvania experienced fewer deaths. See MSHA, *id.*

<sup>25</sup> The top ten coal-producing countries are as follows: China (2226 Mt), U.S. (951 Mt), India (398 Mt), Australia (301 Mt), South Africa (240 Mt), Russia (222 Mt), Indonesia (140 Mt), Poland (98 Mt), Kazakhstan (79 Mt), and Colombia (61 Mt). See WORLD COAL INSTITUTE: COAL FACTS 2006 *ed.*, [http://www.worldcoal.org/assets\\_cm/files/PDF/coal\\_fact\\_card\\_2006.pdf](http://www.worldcoal.org/assets_cm/files/PDF/coal_fact_card_2006.pdf) (last visited June 4, 2007). Three-fourths of the world's coal reserves are found in Australia, China, India, South Africa, and the United States. See ENVIRONMENTAL LITERACY COUNCIL: COAL MINING, <http://www.enviroliteracy.org/article.php/1122.html> (last visited June 4, 2007); see also ASIA-PACIFIC PARTNERSHIP ON CLEAN DEVELOPMENT AND CLIMATE, COAL MINING TASK FORCE, ACTION PLAN at 3 (2006), available at [http://www.asiapacificpartnership.org/APP%20Action%20Plans/Coal%20Mining%20Task%20Force%20Action%20Plan%20\\_27%20Oct%2006\\_.pdf](http://www.asiapacificpartnership.org/APP%20Action%20Plans/Coal%20Mining%20Task%20Force%20Action%20Plan%20_27%20Oct%2006_.pdf) (last visited June 4, 2007).

<sup>26</sup> Chinese coal mining appears to be the most dangerous in the world. With a production rate of only double that of the United States (see *Coal Production*, <http://www.worldcoal.org/pages/content/index.asp?PageID=188> (last visited June 4, 2007)), the death rate is over a hundred-fold. Between 2000 and 2005, no fewer than 5,670 coal miners died

also experiencing a rise in the level of workplace fatalities. And so, it is natural to ask: Is the 2006 death-spike a statistical anomaly or can it be attributed to some cause, such as lax enforcement of safety regulations, inadequate safety equipment and/or preventive measures, or some other regulatory deficiency? Does the 2006 death-spike simply reflect a rise in coal mining production, such

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in Chinese mines in any one year, with a high of 6,995 deaths in 2002. See *Deconstructing Deadly Details from China's Coal Mine Safety Statistics*, Jan. 6, 2006, <http://www.minesandcommunities.org/Action/press861.htm> (last visited June 4, 2007). In 2006, China witnessed a significant drop in coal mining fatalities to 4,746. See Reuters AlertNet, *China Sees Coal Mine Deaths Fall, But Outlook Grim*, Jan. 11, 2007, <http://www.alertnet.org/thenews/newsdesk/PEK206148.htm> (last visited June 4, 2007).

<sup>27</sup> India, like the United States, has experienced a general downward trend in mining accidents, which it attributes to a shift away from underground mining to mechanized open cast mining and a reduction in underground manpower through mechanization. Drs. R.M. Bhattacharjee and A.K. Sinha, *Safety in Coal Mines*, at slide 8, [http://www.fossil.energy.gov/international/Publications/cwg\\_april06\\_safety\\_dgms.pdf](http://www.fossil.energy.gov/international/Publications/cwg_april06_safety_dgms.pdf) (last visited June 4, 2007).

<sup>28</sup> "According to the Australian Construction, Forestry, Mining and Energy Union (CFMEU), coal mining is the most dangerous occupation in Australia, with coal miners having a one in twenty-eight chance of being killed over a forty-year career." Assia Benmedjdoub & Robert Kotevski, *The Gretley Legacy*, [http://oj.hss.uts.edu.au/oj1/oj1\\_s2004/HunterValleyMining/index.htm#Deathsandinjuries](http://oj.hss.uts.edu.au/oj1/oj1_s2004/HunterValleyMining/index.htm#Deathsandinjuries) (last visited June 4, 2007). Despite a relatively low national fatality rate, Australia recently experienced its own death-spike. "From 2002-2003, the National Occupational Health and Safety Commission recorded twelve fatalities in the mining industry. This is five more than in 2001-2002." *Id.* A four-year study, July 1999-June 2003, conducted by NSW Risk Management Research Centre showed the underground coal sector is incurring the highest number of reported incidents of death or injury and that contact with electricity was increasingly becoming the most common form of injury. *Id.*

Australian underground mining has decreased while surface mining has increased over the past decade. See *The Australian Coal Industry: Selected Summary Statistics*, <http://www.australiancoal.com.au/industrystats.htm#employment> (last visited June 4, 2007). Recently, the Australian and Chinese governments signed a memorandum of understanding to "exchange . . . information on regulation, technology, and equipment for coal mine safety." MINERALS COUNCIL OF AUSTRALIA, MEDIA STATEMENT, Apr. 3, 2006, [http://www.minerals.org.au/\\_data/assets/pdf\\_file/0019/11476/MR006\\_06\\_MCA\\_CoalSafety.pdf](http://www.minerals.org.au/_data/assets/pdf_file/0019/11476/MR006_06_MCA_CoalSafety.pdf).

<sup>29</sup> South Africa's coal mining death rate is more than three times that of the United States but 1/30<sup>th</sup> that of China. Zhao Xiaohui & Jiang Xueli (Xinhua), *Coal Mining: Most Deadly Job in China*, Nov. 13, 2004, [http://www.chinadaily.com.cn/english/doc/2004-11/13/content\\_391242.htm](http://www.chinadaily.com.cn/english/doc/2004-11/13/content_391242.htm).

<sup>30</sup> Participants at an EU-Russia technology roundtable that took place in Moscow in June 2005 recognized the obvious dangers of coal mining and linked coal mine safety with the industry's profitability. See EU-Russia Energy Dialogue Technology Center, Minutes of the Roundtable, <http://www.technologycentre.org/calendar-show.php?calendar=35> (last visited June 4, 2007).

<sup>31</sup> Britain appears to be one of the safest mining countries, experiencing less than one death per year in the entire industry. See Table 2: *Coal Mine Injury Rates Per 100,000 Work Shifts*, <http://www.hse.gov.uk/mining/accident/coalisd2.htm> (last visited June 4, 2007). Britain also is not, however, a top ten world coal producer. See *World Coal Institute*, *supra* note 25.

that the number of absolute deaths does not actually reflect a relatively more dangerous workplace?<sup>32</sup> Or is there some other explanation?

This analysis is complicated by a fundamental distinction between work environments. Mining in the Appalachian Coal Region, which includes West Virginia, Kentucky and Pennsylvania, is conducted in large underground mines while coal mining in the Great Plains and Inter-Mountain West occurs mainly in mid-sized to large surface mines.<sup>33</sup> This difference in the type of mining done in the Appalachian Coal Region affects the cause of death and possibly fatality rates. Underground mining accidents tend to be caused by explosion, which may cause miners to become trapped, and the death toll in any given event is increased as well as the potential for sensationalization. By contrast, surface mining accidents often involve machinery or truck accidents, blasting injuries and falls. In any event, an accurate statistical analysis of fatality rates must account for the differences in these types of mining in order to (1) document with precision the types of hazards associated with each and (2) develop strategies for addressing those hazards.<sup>34</sup>

Even if the 2006 death-spike turns out to be a statistical anomaly, the Sago disaster drives home the dangers inherent in coal mining, especially underground coal mining. From a cost-benefit perspective, it is important to inquire whether the industry and government regulators support economically reasonable steps to keep miners safe. From a human rights perspective, on the other hand, one must bear in mind that twenty-two deaths per year are twenty-two too many deaths—and it is essential to ask whether those institutions are doing all they *should* to keep miners safe. That inquiry leads to a host of other questions that we can divide into three categories: regulation, enforcement, and technology.

With respect to regulation and enforcement, we must identify the extent of any relationship between mine safety regulations and trends in mine safety. One might ask whether and how downward trends in mining injury and fatality rates correlate with increased regulation and, more importantly, increased enforcement of safety regulations. Do upward trends correlate with lax enforcement of existing regulations, deregulation, or even failure of the government to provide sufficient funding for inspection and regulatory enforcement? No mat-

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<sup>32</sup> According to the National Mining Association, the United States has witnessed an eighty-seven percent increase in coal production since 1970 and an eighty-seven percent decrease in fatalities during the same time-period. See *U.S. Coal Mine Safety and Production Trends*, [http://www.nma.org/pdf/sago/s\\_coal\\_safety\\_production\\_trends\\_011806.pdf](http://www.nma.org/pdf/sago/s_coal_safety_production_trends_011806.pdf) (last visited June 4, 2007).

<sup>33</sup> See Energy Kid's Page, *supra* note 8.

<sup>34</sup> A comparative analysis of underground mining hazards alone may reveal significant differences. For example, the greatest number of underground mining fatalities in India are caused not by explosion but by inundation, a problem that underground mines in the United States are not experiencing. Stirling Smith, *Mining: Blood on Coal*, FRONTLINE, Jun. 23, 2001, available at <http://www.hinduonnet.com/fline/fl1813/18130810.htm>.



ter what answers ultimately are identified, it is important that the questions be asked and possible answers be objectively analyzed.

The 2006 death-spike also raises questions regarding the sufficiency of the technology available to coal miners. For example, are the technologies that are currently available—the one-hour SCSR units, the accompanying instruction guides, and explosion-proof seals—sufficient to make underground mining safer? Is the best available technology being used in mines or are regulators and operators settling for cheaper alternatives? Are there technologies not currently available but possible in the near future that would make underground mining safer? If the technology is available, is there a distribution problem? To what extent can post-Sago legislative initiatives and voluntary coal industry efforts contribute to safer coal mines?

Given the complexity of questions raised in Sago's aftermath, both a comparative and an interdisciplinary approach seem like the natural path to travail. Let me begin with the comparative approach.

### III. APPROACHES TO COAL MINE SAFETY

#### A. *The Comparative Law Approach*

Comparative law is the academic examination of various legal systems to determine how those systems differ and compare with one another for the purpose of better understanding our own legal system.<sup>35</sup> Initially, comparative law study allows us to question our own biases by revealing them. What better way to see our implicit assumptions about how the law should look than by studying different solutions to the same legal issue set in different jurisdictions? Such analysis allows us to obtain a deeper and more sophisticated understanding of our own legal system.<sup>36</sup>

By opening our eyes to other ways of regulating behavior, comparative law allows us to find solutions to our own legal problems that may elude us because of our own biases. All academics become entrenched in a certain way of thinking typically inherited from their academic training. And so, when a New-

<sup>35</sup> For an excellent discussion of what is comparative law, see *Oxford University Comparative Law Forum*, <http://ouclf.iuscomp.org/editorial.shtml> (last visited June 4, 2007).

<sup>36</sup> For example, Labor Law Professor Ellen Dannin has written several scholarly articles discussing New Zealand labor law, in part to examine labor law problems through the antipodean lens—a lens that allows the American eye to see more clearly and objectively the problems associated with different approaches. See, e.g., Ellen J. Dannin, *Consummating Market-Based Labor Law Reform in New Zealand: Context and Reconfiguration*, 14 B.U. INT'L L.J. 267 (1996); *Bargaining Under New Zealand's Employment Contracts Act: The Problem of Coercion*, 17 COMP. LAB. L. J. 455 (1996); *Solidarity Forever? Unions and Bargaining Representation Under New Zealand's Employment Contracts Act*, 18 LOY. L.A. INT'L & COMP. L.J. 1 (1995); *We Can't Overcome? A Case Study of Freedom of Contract and Labor Law Reform*, 16 BERKELEY J. EMPL. & LAB. L. 1 (1995); Ellen J. Dannin & Clive Gilson, *Getting to Impasse: Negotiations Under the NLRA and the Employment Contracts Act*, 11 AM. U. J. INT'L L. & POL'Y 917 (1996).

ton, or a Darwin, or an Einstein comes along, we are amazed—amazed that someone trained in a certain way of thinking is able to throw off those academic shackles and think about a problem in a new way. In pursuing law as an academic subject, comparative study makes this process easier by providing the perspective we need to observe anomalies and then, ideally, to appreciate the solution that otherwise eludes us because of our mindset.<sup>37</sup>

The Sago disaster, in some sense, has already done a great deal to reveal anomalies in coal mining safety laws and regulations. Notwithstanding several examples to the contrary,<sup>38</sup> members of the legal community and citizens of this country in general hold fast to the view that our country has moved beyond its industrial-revolution-era history of workplace abuse.<sup>39</sup> At least with respect to coal mining, there is much truth in that perspective. Our current track record easily surpasses the horrors of the pre-1930 period, when on average 2,295 miners were killed each year.<sup>40</sup> But, “while 13 West Virginia coal miners were trapped inside the Sago Mine . . . , three Tasmanian miners were saved from a fire by an 8-by-5-foot steel box.”<sup>41</sup> And less than a month after twelve of the thirteen Sago coal miners perished, “72 miners in Saskatchewan were rescued after being trapped underground for 30 hours, thanks to a similar box called a mine rescue chamber.”<sup>42</sup> On the other hand, less than six months after the Sago disaster, and eight days after the West Virginia Office of Miners’ Health, Safety and Training imposed a statewide moratorium on the installation of supposedly “explosion-proof” Omega block seals used at Sago—five more men in Darby, Kentucky perished in a coal-mine explosion<sup>43</sup> in which Omega block seals also

<sup>37</sup> Of course, this comparative study can be done even at a domestic level. Indeed, one of the strengths of our own legal system is its federal constitutional nature. By allowing the states to experiment with different solutions to the same legal problems facing all of the states, we all benefit from the collective and different experiences of the whole.

<sup>38</sup> Perhaps the best known example is the modern day sweatshop, which remains extant in the United States. See Sweatshop Watch, <http://www.sweatshopwatch.org/index.php?s=67> (last visited June 4, 2007). In fact, the discovery of slave sweatshops in California in 1995, led to the Department of Labor’s “No Sweat” Campaign, which targeted the predominantly female garment workers to increase compliance with labor standards in the garment industry (such as minimum wage, overtime pay, child labor, and safety standards). See *No Sweat Initiative*, <http://www.dol.gov/esa/forum/fact.htm> (last visited June 4, 2007); Honorable Alexis H. Herman, Remarks at the Marymount University Academic Search for Sweatshop Solutions (May 30, 1997), <http://www.dol.gov/oasam/programs/history/herman/speeches/sp970603.htm> (last visited Sept. 19, 2008).

<sup>39</sup> Indeed, most businesses take the position that they view workplace safety as a top priority. See, e.g., *A Majority of U.S. Businesses Report Workplace Safety Delivers a Return on Investment*, BUSINESS WIRE, Aug. 29, 2001, available at LexisNexis.

<sup>40</sup> Thomas Frank, *supra* note 21.

<sup>41</sup> Ken Ward, *MSHA Ignored Law on Rescue Chambers*, CHARLESTON GAZETTE, Feb. 5, 2006, [http://www.accessmylibrary.com/coms2/summary\\_0286-12598920\\_ITM](http://www.accessmylibrary.com/coms2/summary_0286-12598920_ITM).

<sup>42</sup> *Id.*

<sup>43</sup> See 2006 FATALGRAMS AND FATAL INVESTIGATION REPORTS: COAL MINES, *supra* note 6.

failed.<sup>44</sup> Despite the eighty-year trend of declining fatalities in United States' coal mines, the Sago and Darby disasters—two underground mine explosions, six months apart, in which “explosion-proof” seals failed—raise serious questions as to the current safety of the mining industry.<sup>45</sup>

The comparative approach allows us to examine American coal mine safety on several levels. First, we look in our own backyard: how does the West Virginia coal mine safety record stand up to mine safety records in other coal-producing states, especially large coal-producing states like Kentucky and Pennsylvania that engage in underground mining?<sup>46</sup> We might then look elsewhere, to other countries engaged in underground coal mining, and assess the safety of their mines. In both cases, we must ask whether the underlying causes for fatalities differ. For example, preliminary research suggests that death by inundation is increasing in India, while underground flood fatalities have never been a significant problem in the United States.<sup>47</sup> Does that mean that the United States has something to teach India about preventing underground mine floods, or does it mean only that certain geological circumstances make Indian mines more susceptible to flooding than American mines?

To ensure a rich conversation that takes into account all interests, the questions raised by the Law Review editors must be answered by government, industry, and labor, all of whom have been invited to give their perspectives on these and other questions relating to coal-mine safety. This diversity of perspective will ensure a fair discussion of the substantive questions raised in Sago's aftermath.

### B. *The Interdisciplinary Approach*

Let me now turn to the Law Review's interdisciplinary approach to coal-mine safety. Early on, the Law Review editors recognized that substantive questions arose in the context of a regulated industry. In particular, comprehensive federal legislation of coal mine health and safety first appeared in the aftermath of another West Virginia mine explosion—the enactment of the Federal

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<sup>44</sup> Ken Ward, *MSHA: Industry Debate Extent of New Seal Rules*, CHARLESTON GAZETTE, Feb. 23, 2007, <http://wvgazette.com/News/Beyond+Sago/200702230011>.

<sup>45</sup> Joel Darmstadter, *Productivity Change in U.S. Coal Mining*, RESOURCES FOR THE FUTURE, at 22 (July 1997), available at <http://www.rff.org/Documents/RFF-DP-97-40.pdf> (noting trend between 1931 and 1994).

<sup>46</sup> “The three largest coal-producing states are Wyoming, West Virginia, and Kentucky. Texas and Pennsylvania are major producers; eleven other states are significant producers of coal: Alabama, Arizona, Colorado, Illinois, Indiana, Montana, North Dakota, New Mexico, Ohio, Utah, and Virginia.” Statistics available at North American Energy Working Group, *North America: The Energy Picture*, (June 2002) <http://www.eia.doe.gov/emew/northamerica/enginfr3.htm>.

<sup>47</sup> Smith, *supra* note 34.

Coal Mine Health and Safety Act in 1969.<sup>48</sup> Then after another mine disaster, Congress passed the more stringent Federal Mine Safety and Health Act of 1977 (Mine Act of 1977).<sup>49</sup> It is clear that since the passage of the Mine Act of 1977, there has been a steady decrease in coal mining fatality rates, at least until 2006.<sup>50</sup> However, the extent to which comprehensive coal mine safety regulations have affected this downward trend should be evaluated.<sup>51</sup> In any event, that regulatory context, coupled with the current Bush Administration's deregulatory stance on health and safety,<sup>52</sup> forces us to ask two fundamental questions: What role, if any, should the law play in regulating coal mining safety? If the law has a role to play, what remedies or sanctions, if any, should the law mandate?

At first blush, the question whether the law should play a regulatory role in mine safety might be seen by some as a straightforward legal question. But, by bringing together economists, legal academics, and policy makers, the Law Review hopes to spark a richer debate over whether safety regulations in fact make the workplace safer or whether the free market provides sufficient incentives to encourage mine safety. And so, we have invited free market thinkers here who advocate the position that the problems inherent in coal mine safety are best solved first by repealing the Mine Act of 1977 and then by allowing the free market to drive unsafe mines out of business.<sup>53</sup> In their view, in a free market, safer mines would attract better workers and would thrive. Those free market advocates disagree with those who believe that regulation is justified for both economic and moral reasons. Those who favor regulation view market

<sup>48</sup> See Davitt McAteer, *Farmington Victims Left Legacy to Nation's Miners*, (Jan. 1999) <http://www.wvgenweb.org/wvcoal/farm.html> (last visited June 4, 2007) (explaining that "the Farmington disaster was a catalyst for passage of the 1969 Coal Mine Safety and Health Act").

<sup>49</sup> 30 U.S.C. § 801 et seq. In 1977, Congress also enacted the Surface Mining Control and Reclamation Act. 30 U.S.C. § 1201 et seq.

<sup>50</sup> According to the U.S. Department of Labor, "Mining fatalities dropped sharply under the [MSHA] from 272 in 1977 to eighty-six in 2000." HISTORY OF MINE SAFETY AND HEALTH LEGISLATION, <http://www.msha.gov/MSHAINFO/MSHAINFO2.HTM> (last visited June 4, 2007).

<sup>51</sup> Some commentators believe, for example, that the regulations have had little or no beneficial effect. See C. Gregory Ruffennach, *Saving Lives or Wasting Resources? The Federal Mine Safety and Health Act. No. 453 Policy Analysis*, CATO INSTITUTE, Sept. 19, 2002, <http://www.cato.org/pubs/pas/pa453.pdf> (last visited June 4, 2007).

<sup>52</sup> According to the AFL-CIO,

Under the Bush administration, regulatory activity at both the Occupational Safety and Health Administration (OSHA) and the Mine Safety and Health Administration (MSHA) has ground to a halt. Important standards close to completion at the end of the Clinton administration—including a standard on employer payment for personal protective equipment—have been withdrawn or delayed repeatedly by the Bush administration.

*Death on the Job: The Toll of Neglect*, at 1 (16th ed. April 2007), [http://www.aflcio.org/issues/safety/memorial/upload/doj\\_2007.pdf](http://www.aflcio.org/issues/safety/memorial/upload/doj_2007.pdf) (last visited June 4, 2007).

<sup>53</sup> Ruffennach, *supra* note 51 (advocating the free market approach of deregulating).

failures as driven in part by imperfect information or inequality of bargaining power between the coal miners and their employers. More fundamentally, those who favor mine safety regulation believe that it is the moral obligation of our legislature to enact laws to protect workers.

Assuming a regulatory scheme should be in place, one might ask whether enforcement measures currently in place are sufficient. Are fines adequate or should criminal sanctions including imprisonment be imposed for willful violation of federal or state safety standards? In fact, the Mine Act of 1977 provides for criminal sanctions<sup>54</sup> but regulators do not systematically impose such penalties.<sup>55</sup> And perhaps less obviously, we must ask whether Congress is properly funding administrative agencies charged with inspecting mines so that those agencies can realistically achieve their mandate to keep American miners safe.<sup>56</sup>

Assuming there is a role for law—to combat market failure, to fulfill a perceived human-rights goal of creating some floor of employee safety rights, or to achieve a combination of those economic and social goals—one must re-evaluate what we need to regulate and whether some current regulatory approaches should be discarded for new initiatives.<sup>57</sup>

To answer these questions, we need to hear from the various constituents, labor officials and industry representatives, who, because of their experience working in and operating mines, can identify some of the things that we need to regulate. We might look to the Sago Preliminary Report for suggestions as to the appropriate direction to follow. According to that Report, several technological failures likely led to the Sago disaster. The Omega block seals failed. Communications systems failed. The miners' breathing equipment failed, eliminating the possibility of escape and leaving the miners to barricade themselves as a last resort. Finally, unlike the mines in Tasmania and Saskatchewan, the Mine Act of 1977 did not require, and the Sago mine was not equipped with, an emergency shelter that could have allowed miners to survive underground for an extended period of time.

While the Report makes several recommendations regarding each of these failures, the Law Review Symposium seeks the insights of engineers and other experts who can discuss how to solve these problems. The Law Review has invited lawmakers to discuss recent unprecedented legislative initiatives and how advances in technology are being and/or can be distributed to coal miners. Finally, the Law Review solicits a discussion relating to training miners and rescuers in the use of new communications and other equipment.<sup>58</sup>

<sup>54</sup> See HISTORICAL DATA ON MINING DISASTERS IN THE UNITED STATES, *supra* note 1.

<sup>55</sup> Harsh Trivedi & Ilissa Brownstein, *Employment-Related Crimes*, 39 AM. CRIM. L. REV. 355 (2002).

<sup>56</sup> *Death on the Job: The Toll of Neglect*, *supra* note 52.

<sup>57</sup> See, e.g., David T. Zaring, *Best Practices*, 81 N.Y.U. L. REV. 294 (2006).

<sup>58</sup> This interdisciplinary, problem-solving approach is similar to the approach taken by The Yale Center for Environmental Law and Policy, whose mission is "to advance fresh thinking and

In sum, an interdisciplinary approach is essential to address the following questions: What technology is needed? Is the technology available? If not, can it be developed? If it is developed, why hasn't the technology been distributed? With that purpose in mind, the Law Review Symposium presents a Post-Sago Roundtable with industry representatives, labor representatives, engineers, business experts, legislators, regulators, and many others to brainstorm and resolve these questions.

#### IV. CONCLUSION

Coal mine safety is a significant issue for West Virginia, the nation, and the global economy. Although coal mining in the United States as a whole is safer than coal mining in most other countries, West Virginians seem to pay a higher price than others for the collective good of the global economy. And so, our Law Review symposium asks these questions with the hope that a comparative and interdisciplinary approach to coal mine safety will precipitate creative thinking that will help keep our miners safe.

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analytically rigorous approaches to environmental decisionmaking – across disciplines, sectors, and boundaries.” Mission statement available at <http://research.yale.edu/envirocenter/index.php?page=mission>. (last visited Sept. 10, 2008).

